DOCUMENT RESUME

ED 466 797 IR 021 410

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TITLE	An Asynchronous Augmentation to Traditional Course Delivery.
PUB DATE	2002-04-06
NOTE	15p.
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Computer Mediated Communication; Distance Education; Instructional Materials; *Learner Controlled Instruction; *Professional Education; *Real Estate; Teaching Methods
IDENTIFIERS	*Asynchronous Learning Networks; Distributed Cognition

ABSTRACT

Asynchronous augmentation facilitates distributed learning, which relies heavily on technology and self-learning. This paper reports the results of delivering a real estate principles course using an asynchronous course delivery format. It highlights one of many ways to enhance learning using technology, and it provides information concerning how students accept and use unique an otherwise unfamiliar learning tools. The data reveal modes of access to course materials, how learning resources were used and valued by students, how this distributed learning course compared to traditionally delivered courses on several dimensions, and open-ended student comments (both favorable and unfavorable). The goals established at the outset of course development are compared with outcomes reported by students over a three-semester trial, and informed conjectures are provided regarding the costs and benefits of developing an asynchronously augmented real estate principles course. An illustration is provided depicting animated lecturing on urban sprawl, and three tables provide information on access to course materials, use and value of learning resources, and comparison with traditional course delivery. (Contains 8 references.) (Author/AEF)

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An Asynchronous Augmentation to Traditional Course Delivery

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April 6, 2002

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IR021410

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An Asynchronous Augmentation to Traditional Course Delivery

Asynchronous augmentation to traditional course delivery refers to instruction that is accessible at times outside scheduled class meetings. It is an intervention designed and initiated by the instructor but used by the student. Asynchronous augmentation facilitates distributed learning, where a number of technologies are integrated to afford students the opportunity to engage in activities in both real-time and remote settings. It blends various technologies to allow for both campus-based and distance education (Reid, 1999).

Distributed learning has two essential components: a heavy reliance on *technology* and *self-learning* (Volery, 2001). Technology, in today's education environment, usually refers to the use of computers and web-based, online delivery systems. Computers provide unparalleled capacity to manage and access information and present it in novel and interesting ways. Technology provides student access to learning resources, which require different methods of learning. Such computer-assisted, web-based resources might include visuals, well-organized print, vicarious and virtual experiences, and applications to real-life situations. Used to its potential, it facilitates student learning (Chickering and Ehrmann, 1996 ;Daniel, 1997; Gaddis, Napierkowski, Guzman and Muth, 2000; Volery, 2001). "Self-learning implies that the learner assumes responsibility for specifying individual learning needs, goals and outcomes, planning and organizing the learning task, evaluating its worth, and constructing meaning from it" (Candy, Crebert, and O'Leary, 1994, p. 128). It involves self-reflection and self-evaluation and allows students to structure their own learning and use of time (Chickering and Ehrmann, 1996). In essence, self-learning focuses on learning by the individual student rather than mass lecturing by the instructor.

This paper reports the results of delivering a real estate principles course using an asynchronous course delivery format. It highlights one of many ways to enhance learning using technology, and it provides information concerning how students accept and use unique and otherwise unfamiliar learning tools.

Real Estate Principles Course

Real Estate Principles is taught at the junior level (RE 305) at Washington State University (WSU), and serves as an entree into the real estate degree program as well as a general interest course for the broader student population. Prior to asynchronous augmentation, the course was offered in a "traditional" survey course format spanning a 15 week semester. It consisted of three 50 minute periods of lecture per week (or two 75 minute periods if taught two days per week) following a PowerPoint® outline displayed on video monitors, an occasional guest speaker, assigned textbook readings, and examinations. Photocopies of the PowerPoint® slides were available to students at an on-campus copy center, and were popular as a note-taking aid. Examinations were designed to assess student achievement as the course progressed

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through five sections of the textbook,[1] including real estate markets, the legal framework of real estate, real estate services, real estate transactions, and real estate investment.

To devise a means of delivering the real estate principles course to off-site and branch campus students, the College of Business and Economics and one branch campus initiated and funded creation of a stand-alone, web-based real estate principles lecture series. The course developer chose to create a college-server-resident program relying on Microsoft Agent® software. This choice was made for several reasons, including cost (free license to colleges and universities), ease of integration with PowerPoint,® integrated text-to-speech engine (Lernout & Hauspie®), and ease of updating and modification. Over the course of one and one-half semesters the PowerPoint® slides already in use in the traditional class format were modified, edited, and integrated into a series of animated, server-resident lectures covering the RE 305 curricular material ready for use in a distance education setting. Exhibit 1 illustrates the animated character discussing a lesson as seen on a typical monitor.

Initially, the newly developed course was intended for use as a stand-alone, asynchronous, web-resident product designed to enable a distance education effort. However — having developed a free-standing, web resident course — the course developer decided to experiment with integration of the new electronic materials into the live, on-campus classroom. One such asynchronously augmented section of RE 305 was offered in the summer of 2000, fall 2000, and in spring 2001. The summer course was delivered over a six week time period, whereas the fall and spring semester courses were delivered over an 11 week period. These time periods are compressed, compared with the 15 week period typical of a traditional semester at WSU.

Students could elect to register in the asynchronously augmented compressed time period course or in one of two additional sections taught over 15 weeks in a traditional format. Students enrolled in the asynchronously augmented sections of RE 305 did not attend live lectures. Instead, they "attended" lectures independently and asynchronously by watching and listening to the appropriate animated lecture at a computer accessing the course material either from a CD or the Internet.[2] The animated lectures were supplemented by the textbook, covering the same material that had previously been presented in the traditional classroom setting. Additionally, students were assigned to and required to attend one live session per week, which functioned as a tutorial or seminar, depending on the material being addressed. (An instructor can divide a large class into two or three smaller groups and meet with each group once a week—allowing greater personal contact with students.) A tutorial format was used in the live sessions involving financial problem solving practice and reviewing less familiar topics (e.g., legal descriptions). A seminar format was used in the live sessions involving discussion of topical readings assigned

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[1] The text used in this course was C. F. Floyd and Allen, M. T. (1999). *Real Estate Principles*, 6 ed., (Chicago, IL: Dearborn Financial Publishing, Inc.).

[2] The license agreement with Microsoft allows distribution to WSU students via CD provided no profit is made from same.

from sources other than the textbook such as the *Wall Street Journal*, newspapers (Atlanta, Seattle, Los Angeles, Washington, D.C., and Boston), and professional journal or magazine articles appropriate for introductory level students.[3] The weekly live sessions also provided opportunities to administer examinations of traditional length and frequency.

The new format represented a purposeful attempt to address a number of concerns inherent in the traditional class format. For example:

- Three contact hours per week did not allow sufficient time for coverage of the broad amount of subject matter found in the textbook along with discussion of outside readings selected to add depth and realism. Invariable, some material was omitted due to time constraints. Use of animated lectures freed up live contact time to explore topical outside readings[4] and concentrate on the most problematic aspects of the underlying curriculum (e.g., time value of money and legal descriptions).

- Many students attended class sporadically, and attendance was particularly poor on certain days of the week or prior to long weekends or holidays. This behavior led to a concern regarding the accuracy and completeness of lecture notes borrowed from other students or on-campus, note-taking services. Asynchronous delivery of the core curriculum allowed students to "attend" class at their convenience. Furthermore, there was no longer a need for borrowed notes because students had direct access to the source material at all times.

- With a traditional course delivery format, international students were afforded only one opportunity to hear an oral presentation of unfamiliar material, such as real estate principles, in a language foreign to them. The new course format allowed students to "attend" lectures or subsets of lectures as many times as they desired. Additionally, the spoken text appeared in written form on the computer screen as it was being recited by the animated character ("Merlin"), allowing for both visual and audio reception of the lecture content.

Data and Analysis

Data were derived from student questionnaires administered at or near the end of each asynchronously augmented course. The questionnaire was designed to assess access to course materials, how the various learning resources were used by the students, comparison with traditional course delivery, student recommendations, and other information not relevant here.

Access to Course Materials (Table 1)

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[3] All of the additional readings were readily searchable and accessible on line via library subscriptions to Proquest® and Lexis-Nexis®.

[4] A total of 37 supplemental readings were assigned to be read over the semester.

Students had two ways to access the animated lectures, via the Internet or directly from a compact disk (CD). Fifty-eight point seven percent (58.7%) viewed the lectures exclusively from the CD, 27% used the Internet exclusively, and 14% accessed the lectures from both sources. Those who used both the internet and CD to access the lectures reported using the internet 60% of the time and the CD 40% of the time. The CD was provided as a more convenient means to access the lectures, and student use of this means of access proved to be high.

A large majority of the students used a computer that they owned to access the animated lectures (75.2%). Other computer resources used to access the lectures were a dorm or fraternity computer (10.8%), a friend's computer (6.2%), the University's computer labs (6.1%), and other computer resources (0.2%). These data seem to imply that computer resources are readily available to students, and that they prefer to do computer-related work where they live (own computer, dorm or fraternity computer, friend's computer) rather than relying on an on-campus computer lab. This result may also be a byproduct of additional fees WSU students must pay in order to obtain an on-campus computer account.

Supplemental readings were also accessed via the Internet using search engines subscribed to by the university library. Reading method preferences varied, with most of the students printing the readings for later reading (72.6%), followed by reading on line (19.4%), and sending them to themselves by email for later reading (8.1%). Students rated ease of access to the supplemental reading material to be either easy (40.6%), somewhat difficult (53.1%), or difficult (6.3%). Discussions with students indicating difficulty with access to the online readings revealed that most of the difficulty stemmed from not knowing how to perform an advanced search on Proquest,® which reduces the need to browse through numerous "hits" to find the article being sought.

Use and Value of Learning Resources (Table 2)

Almost all of the students enrolled in these sections read some portion of the assigned textbook readings. Responses indicate that 58.5% read each assignment at least once, 18.5% read each assignment more than once. However, 21.5% read less than all of the assigned text material, and one student reported having not read any of the assigned readings from the textbook. One student also reported that the textbook did nothing to enhance learning. Conversely, 63.1% indicated that the textbook greatly enhanced learning, and 35.4% said it enhanced learning a little. One goal was to create an animated learning tool that complemented the textbook. These results imply that this goal may have been met.

Students made considerable use of the animated lectures, with 75.4% of them reporting that they viewed all of the components of the lectures at least once. Interestingly, and in keeping with the course design goal of an ability to "attend" lectures or parts thereof as often as desired, 44.6% of the students reported viewing some parts of the animated lectures more than once. Twenty-six students (40%) were intense users, viewing each full lecture more than once and also viewing many of the smaller subsets separately. Two students (3.1%) reported never viewing the lectures (the equivalent of never going to class), and 14 (21.6%) were occasional viewers.

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About 80% of the students reported using the shorter lecture subsets to review difficult material, with 37.3% reporting that they viewed the subsets covering material they found to be difficult more than once.

As mentioned earlier, the asynchronous augmentation format allowed the addition of, and live discussions of, supplemental readings to the course materials. Forty-seven point seven percent of the students (47.7%) indicated that they had read all 37 of the supplemental readings, and an additional 32.3% said they had read most of them. This information supports at least partial achievement of the goal of using supplemental readings to add depth and realism to the course.

The web site and CD contained three learning resources in addition to the animated lectures—PowerPoint® slides identical to the information contained in the animation frames intended for note-taking use, answers to end of chapter exercises, and outlines of each lecture. Students reported the following frequencies of use for these resources: PowerPoint® slides, never used (20%), used occasionally (30.8%), used often (21.5%), used always (27.7%); end of chapter exercise answers, never used (18.5%), used occasionally (27.7%), used often (21.5%), used always (32.3%); lecture outlines, never used (31.7%), used occasionally (33.3%), used often (25.4%), used always (9.5%). Lecture outlines and PowerPoint® slides contained redundant information, and responses indicate a preference for PowerPoint® slides over the outlines in textual format. Based on discussions with students, the PowerPoint® preference was greater than reported, since a number of students did not have PowerPoint® software installed on the computer primarily used for viewing the learning material. Based on this early feedback, hard copies of the PowerPoint® slides were made available at the copy center, and 31% of the students reported they had purchased them.

Comparison with Traditional Course Delivery (Table 3)

Students were asked to compare the amount of time and effort spent on this course with courses using conventional delivery systems. More than 90% of the students enrolled in the asynchronously augmented sections said that they spent either the same amount of time and effort (66.2%) or more time and effort (26.2%) on this course than on the typical conventionally delivered course. Five students (7.7%) said they spent less time and effort than they would have spent on a traditional course. In addition, 69.2% said this format was more interesting than the traditional format. Sixteen point nine percent (16.9%) said it was as interesting as a traditional course format, and 13.8% said it was less interesting.

To the extent that level of interest signals engagement, students appear to have been more engaged than they may have otherwise been. Additional support for this conjecture comes from the fact that 67.2% of the students said that the distributed learning format of this course was more conducive to learning. However, 10.9% found it less conducive to learning, suggesting that the format is not for everyone. Importantly, more than three-fourths of the students (76.9%) said that the way the course was delivered positively impacted their desire to learn more about the real estate profession.

Eighty percent of the students who took the course said they would recommend an asynchronously delivered course to a friend, and their reasons for doing so stemmed mostly from aspects of the delivery format—32.4% thought that the online resources made it easy to study, 23.4% simply liked the asynchronous format, and 18% liked the live tutorials. Another 24.3% said they would recommend a course delivered asynchronously because they learned a lot. Two students said they would not recommend the course because it took too much time.

Student Recommendations and Comments

Three groups of students enrolled in the asynchronously delivered real estate principles course, each in a different semester. Eleven students took the course during a six-week summer session, 39 students enrolled in the following fall, and 17 in the spring. The fall and spring sessions each ran for the first eleven weeks of a conventional 15-week semester. In an attempt to determine student perceptions of the optimal delivery time for such a course, all students were asked to compare the compressed schedule that they experienced to four options—a six week summer-length schedule, 10 weeks, 12 weeks, or 15 weeks. Most students suggested that the course was best suited for shorter than normal academic-semester delivery. About 25% believed that the asynchronous format lent itself to a six-week session, another 25% thought that 10 weeks during a regular academic semester would work well, 40 % liked the notion of extending the course to a 12-week period. Only 11% felt that the course should be delivered using the full 15-week semester.

Student comments are divided below into favorable and unfavorable, from the student's perspective (e.g., "had to study longer" is more than likely an unfavorable comment from a student's perspective, but also may be viewed as a positive learning outcome).

Favorable comments:

- more freedom with study schedule,
- kept up with reading and was able to concentrate on lectures,
- spent more time, went over things more than once,
- more carefully guided, less mystery about work expectations and required work,
- reviewed more of assigned readings than usually do,
- more prepared for live lectures [tutorials],
- computer enhances [the course],
- more effective use of my time,
- able to take notes at computer which helped with organizing study routine,
- it was easier to stay on top of things, learning all week made it easier to study for exams,
- studied a little everyday,
- used notes and outlines to study for tests,
- utilized answers to exercises in text, and
- used Merlin as main focus for studying.

Unfavorable comments:

- more reading,
- read during week then cram on Saturday and Sunday,
- only studied night before tests,
- had to do things in certain order, i.e., read text, listen to Merlin, then read articles,

- had to watch and know stuff from animated lectures,
- took more time because learned more in less time,
- had to study longer,
- didn't study as much,
- used more note cards, and
- more reading, more studying, but less hands-on and group work.

Favorable comments stress scheduling freedom and effective use of time, ability to access additional learning resources such as notes and answers to exercises, and more productive study routines. Unfavorable comments included the extent to which the course required more self discipline (more reading, doing things in a certain order, and studying longer). Others commented on being able to study less and being able to put off studying until the last day before an examination. However, viewed in context of the entirety of responses to the questionnaire, those who studied less appear to have been a small minority.

Addressing the Initial Concerns

Original impetus for the course design efforts described in this paper revolved around three major concerns—the inability to adequately cover course content, the sporadic class attendance of students, the disadvantage placed on certain students due to limited exposure to course materials—and the desire to provide course access to off-site students.

For the most part, the goals set forth at the start of the project were achieved. The branch campus received a CD containing all of the elements of a virtual real estate principles course that could become server resident and was easy to update and maintain (to the authors' knowledge the virtual course was never implemented by the branch campus). The distributed learning augmentation to the live lectures achieved the goal of adding depth and realism to the course without sacrificing any textbook material because if the addition of an extensive outside reading list. It also allowed students to "attend" lectures at their convenience and to "attend" lectures or subsets of lectures as many times as necessary. Another, unplanned benefit was enabling student athletes to carry their lectures with them on road trips and play them on laptop computers provided by the athletic department.

No student was unable to access the lectures, however headphones were required when watching the lectures in computer labs where no speakers were available or where speaker noise would have disturbed other students (the headphones students have for CD players work perfectly). The ability to make the course entirely CD resident was an important innovation, allowing the lectures to be viewed almost anywhere and overcoming problems associated with slow modem connections to the internet. The importance of this aspect of course deliver is underscored by the fact that the majority of the students used the CD exclusively as a means of watching the lectures. Library subscriptions to full text news articles and journals enabled the course to expand its horizons and produce the side benefit of teaching students how to access current and topical information by using library resources.

Student feedback was a catalyst for several ideas for course refinement. First, it became apparent early-on that student ownership of PowerPoint ® software was much less prevalent than ownership other Microsoft products such as Word ® or Excel.® Arrangements for access to photocopies of PowerPoint® notes were made prior to the start of each semester as a

consequence of this. In addition, students should be notified that the course requires a substantial time commitment, even though they meet in a live classroom only once per week. They should also be told to attempt to access the animated lectures as soon as possible, allowing time to debug the inevitable snags associated with installing and running unfamiliar software. Drawbacks pointed out by students that cannot be overcome at this time include the software running exclusively on Microsoft's Internet Explorer® (free use seems to be a fair tradeoff here) and an inability to view the lectures on Apple Computer hardware.

Final Thoughts on the Costs and Benefits of Asynchronous Course Augmentation

Creation and implementation of a distributed learning course is a time-consuming enterprise, especially in terms of sunk cost prior to the first offering. The author of this course was given course release time in which to develop the course described here. The PowerPoint® slides were already in existence for the most part (this represents an added cost if a totally new course were to be developed). Even so, it took about 30 weeks of concentrated, at least half-time (20 hours a week) effort to create a workable course.

A sizeable investment of time is required to learn the animation software, the programming language, and how to efficiently organize and file the lecture files and images. Writing and choreographing the lectures is both time consuming and initially unfamiliar. Each chapter's lesson is written much like an act in a many-part play, where the course creator designs the set (the PowerPoint® slide), orchestrates the scene (positioning the animated character on the screen and animating its gestures), and writes the screenplay in Visual Basic Script.[5]

Creation and facilitation of on-screen access to additional learning resources is also time consuming. For instance, the answers to the end of chapter exercises required extensive editing for content and grammar, outlines were written for each lesson, and on-screen frames were designed to allow the links to slides, exercises, and outlines to be always present on screen when the lectures were playing. In addition, the linkage frame included click-on links that started subsets of the lectures, enabling students to select focused topics for review without having to view an entire lecture. (These links appear just below the Internet Explorer® navigation/address bar in Exhibit 1.) An initial start page was designed and employed as well, with links to requisite, but free, software including Microsoft Agent,® the Merlin® character, the text-to-speech engine, and Internet Explorer.® This page also included instructions to students regarding hardware requirements and how to begin. Links to each lecture were also imbedded in the start page.

The tradeoff in instructor time occurs in three ways. First, no time is spent lecturing once the course is up and running. Second, it is possible (where allowed) to compress the semester into a shorter time period, allowing several weeks of time each semester for other academic pursuits. Third, once created, the course lectures can be revised and edited quickly and easily. When combined with the learning outcomes, the payoff may exceed the investment for some.

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[5] Professor Ray August's web site contains an animated lecture describing how to create an animated, virtual lecture. It also demonstrates how the interface appears from the student's perspective. This site was immensely helpful as a starting point, and is recommended to anyone who is interested in creating a similar course. Ray August's internet address is http://www.august1.com/lectures/HowTo/.

Although anecdotal, the course developer's perception is that student performance was generally superior in the distributed learning environment. The drop out rate was lower, exam scores were noticeable higher, and student's seemed to be much more engaged in learning (which they indicated by their questionnaire responses). Use of the additional, on-line or on-CD learning resources was high, and students seemed to appreciate having these additional tools readily available to them at no cost.

On balance, the benefits of implementing a distributed learning course augmenting live tutorials and seminars with animated lecture material seem to outweigh the costs. However, the initial learning curve is steep, especially for a programming novice, and the frustration level at the outset can be overwhelming at times. Support from the department and college are important components of embarking on an adventure such as development of a course like this. The freedom to experiment and the necessity of placing one's research stream in abeyance are important and easily overlooked intangible requisites for this type of course development.

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Exhibit 1: Animated Character Lecturing on Urban Sprawl

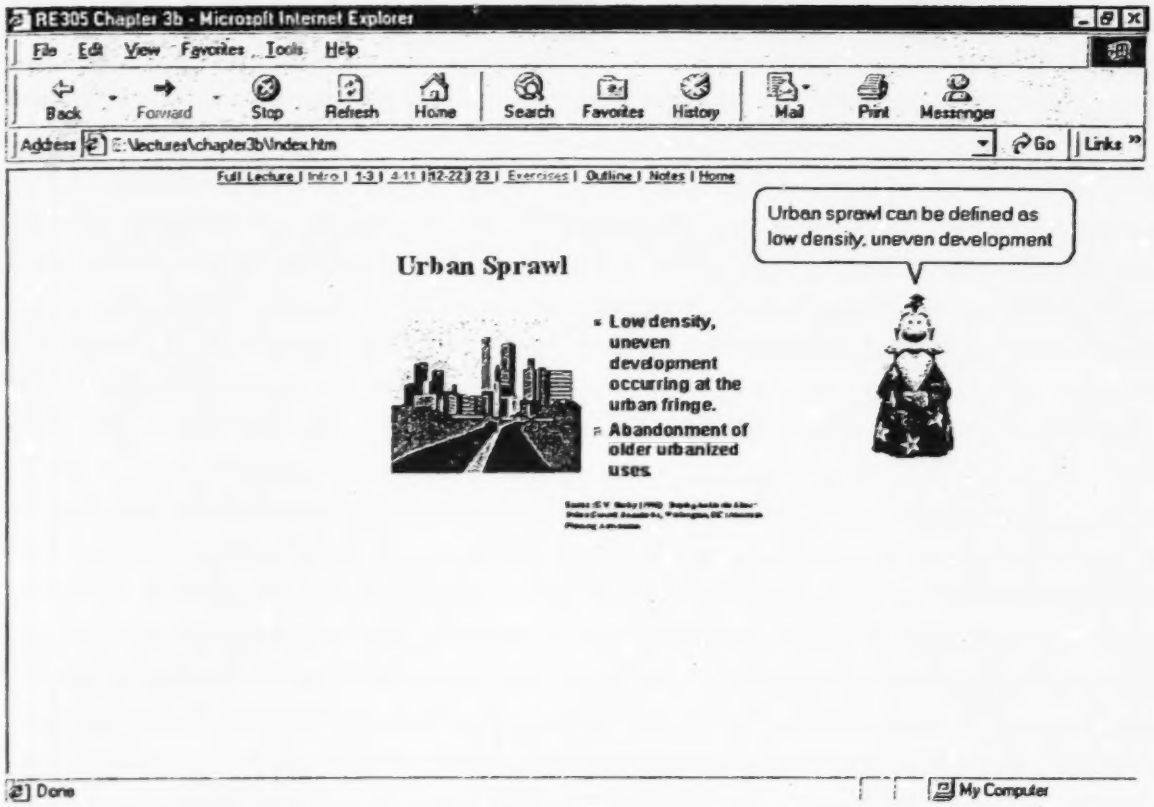
RE305 Chapter 3b - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Messenger
Address E:\lectures\chapter3b\index.htm
Go Links
Full Lecture | Intro | 1-3 | 4-11 | 12-22 | 23 | Exercises | Outline | Notes | Home
Urban sprawl can be defined as low density, uneven development
Urban Sprawl
Low density, uneven development occurring at the urban fringe.
Abandonment of older urbanized uses
Done
My Computer

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Table 1: Access to Course Materials

Item	Observations	Relative Frequency
Access to Lectures		
Exclusively from the CD	37	58.7%
Exclusively from the Internet	17	27.0%
Both the CD and the Internet	9	14.3%
Supplemental Reading Methods		
Read them on line	12	19.4%
Printed them and read them later	45	72.6%
Emailed them to myself to read later	5	8.1%
Ease of Access to Supplemental Readings		
Easy	26	40.6%
Somewhat difficult	34	53.1%
Very difficult	4	6.3%

Item	Mean Reported Percent of the Time	Standard Deviation
Computer Used to Access Lectures		
Student's own computer	76.2%	40.8%
Dorm or fraternity computer	10.8%	30.0%
Friend's computer	6.2%	20.0%
University computer lab	6.1%	22.0%
Other	0.2%	1.2%

Table 2: Use and Value of Learning Resources

Item	Observations	Relative Frequency
Intensity of Textbook Use		
Read each assignment more than once	12	18.5%
Read each assignment at least once	38	58.5%
Read some of the assignments	14	21.5%
Never read the textbook	1	1.5%
Textbook Learning Enhancement		
The textbook greatly enhanced learning	41	63.1%
The textbook enhanced learning a little	23	35.4%
The textbook didn't enhance learning	1	1.5%
Animated Lecture Viewing (Full Lectures and Subsets)		
All full lectures more than once, and some subsets more than once	26	40.0%
Some lectures more than once but no subsets	3	4.6%
Full lectures at least once	15	23.1%
All of the subsets, full lectures seldom	5	7.7%
Full lectures occasionally	7	10.8%
Subsets occasionally	7	10.8%
Did not view animated lectures	2	3.1%
Using the Animated Lecture Subsets for Reviewing Difficult Material		
Typically viewed them more than twice	2	3.4%
Typically viewed them twice	20	33.9%
Typically viewed them once	25	42.4%
Never viewed them for this purpose	12	20.3%
Supplemental Reading Intensity		
Read each more than once	1	1.5%
Read all of them, some more than once	7	10.8%
Read all of them at least once	23	35.4%
Read most of them	21	32.3%
Read less than half of them	10	15.4%
Didn't read any of them	3	4.6%

Item	PowerPoint® Slides	Exercise Answers	Lecture Outlines
Use of Additional Learning Resources			
Always	27.7%	32.3%	9.5%
Often	21.5%	21.5%	25.4%
Occasionally	30.8%	27.7%	33.3%
Never	20.0%	18.5%	31.7%

Table 3: Comparison with Traditional Course Delivery

Item	Observations	Relative Frequency
Comparative Time and Effort Expended		
More than for a typical course	17	26.2%
The same as a typical course	43	66.2%
Less than for a typical course	5	7.7%
Comparative Extent of Interest		
More interesting than a traditional course	45	69.2%
Similar to a traditional course	11	16.9%
Less interesting than a traditional course	9	13.8%
Comparative Learning Enhancement		
More conducive to learning	43	67.2%
Similar to a traditional course	14	21.9%
Less conducive to learning	7	10.9%
Stimulation to Learn More About Real Estate		
More interested in learning about real estate	50	76.9%
Interest level unchanged	13	20.0%
Less interested in learning about real estate	2	3.1%
Would You Recommend a Course Taught This Way to a Friend		
Yes	52	80.0%
Maybe	9	13.8%
No	4	6.2%
Reasons For or Against Recommendation[A]		
This format takes too much time	2	1.8%
I liked asynchronous access to the lectures	26	23.4%
I liked the live tutorials	20	18.0%
On line resources made it easy to study	36	32.4%
I learned a lot	27	24.3%

[A] Total exceeds the number of students due to multiple responses to many of these items.

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An Asynchronous Augmentation to Traditional Course Delivery

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Corporate Source:
UNLV

Publication Date:
April 6, 2002

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